



TAHOE  
REGIONAL  
PLANNING  
AGENCY

# 2018 ANNUAL MONITORING REPORT

TAHOE REGIONAL PLANNING AGENCY

|| *Lake Tahoe*



April 2019



# TRPA Annual Monitoring Report - 2018

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**Overview:** This report summarizes the monitoring conducted by the Tahoe Regional Planning Agency (TRPA) in 2018. The Bi-State Compact directs TRPA to establish environmental goals for the Tahoe Basin (threshold standards) and TRPA and its partners monitor progress towards those goals. TRPA and its partners produce the threshold evaluation report every four years to provide a snapshot of the overall environmental health in the Region. Like project work in Tahoe, monitoring is a collaborative effort of the many partners in the Region. The agency funds other monitoring work completed by partners (e.g. lake clarity), and helps partners coordinate monitoring work in the Tahoe Basin. The findings of those monitoring programs are summarized elsewhere. This report focuses on the monitoring work done by the two TRPA staff dedicated to monitoring in 2018. All monitoring programs described in this report use widely accepted monitoring protocols and have Basin-wide perspective. Additional detail on monitoring programs including details on methodologies and findings from previous years is available at <https://monitoring.laketahoeinfo.org>

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## STREAM MONITORING (BIOASSESSMENT)

**About:** TRPA began monitoring stream habitat and water quality in 2009. Healthy streams are critical to a healthy watershed. To measure the health of the Basin's streams, TRPA uses bioassessment, a method that collects benthic macroinvertebrates (BMI) and stream habitat data to obtain a stream health rating.

BMI are insects such as mayflies and stoneflies that spend most of their lives in a stream. They are highly sensitive to water quality pollution like stormwater runoff and watershed degradation such as erosion, and are therefore a good indicator of healthy streams. TRPA monitors 20 randomly selected "status" sites every year to obtain an overall picture of the Basin's streams, and monitors 20 repeat sites every four years to obtain long-term "trend" data on the health of Tahoe's streams. All stream data is available at

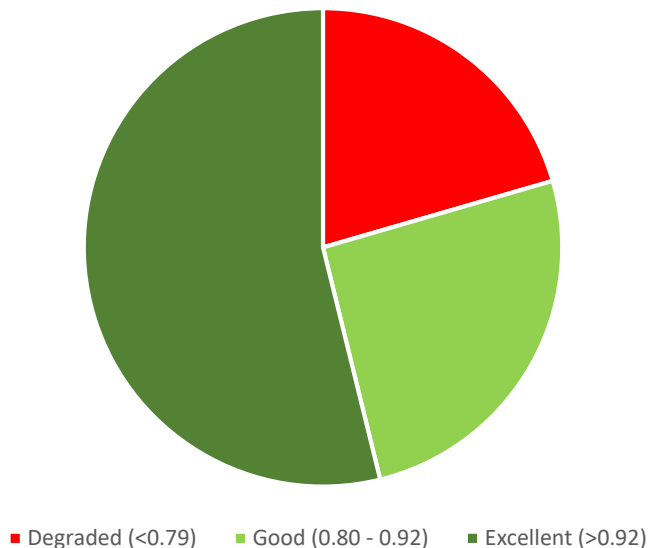
<https://monitoring.laketahoeinfo.org>



*Severe erosion along the Upper Truckee River.*

**Results:** Because lab processing of stream results takes a year, this report focuses on stream results from 2017, not 2018. In 2017, 40 total stream sites were sampled. The summer of 2017 was one of the largest runoff years in Tahoe ever recorded thanks to the record-breaking precipitation in the winter of 2016/2017. Therefore, the drought-related

*2017 Stream Monitoring Results (40 sites)*



stresses on streams from the past years were absent and instead streams were filled with plentiful water all summer.

### Key Findings for 2017:

- Five sites were sampled on completed restoration sites. Four of these sites had good or excellent health for BMI, indicating successful restoration. One site, the Upper Truckee River along the Airport Reach (completed in 2012) remained in marginal health and showed signs

of increased bank erosion.

- The majority of streams sampled in 2017 were in good or excellent health, withstanding massive flooding and high water with little erosion and strong BMI health.
- Degraded conditions continue to be found on the Upper Truckee River where bank erosion and degraded BMI communities remain an issue in areas not restored.

**California Stream Condition Index (CSCI):** The CSCI was developed by California Fish and Wildlife and California State Water Boards in 2015 to assess the condition of California's streams. It uses macroinvertebrate data from over 600 pristine streams in California to set goals for healthy stream biology. The macroinvertebrates collected by TRPA are analyzed by a lab and compared against these pristine streams. The result is a biotic condition "score" from zero to one telling us how healthy our streams are.

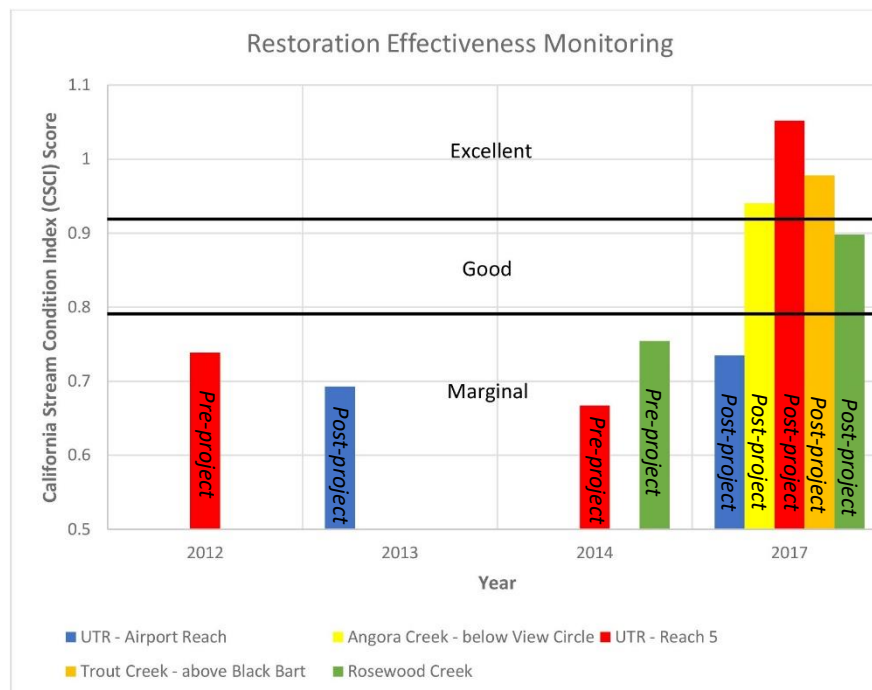
- Degraded conditions continue to be found in some Incline Village streams where stormwater runoff appears to be impacting BMI health.
- Large amount of sediment from snow plowing operations were found at two sites (Edgewood Creek near Stateline, NV and Grass Lake Creek near Luther Pass, CA) and resulted in degraded BMI conditions. This shows the continued importance of controlling sediment from the Region's road network.



*The Upper Truckee River – Airport Reach was restored in 2012. It shows a degraded BMI community and increased bank erosion in 2017.*



*Angora Creek below View Circle was restored in 2010. It shows excellent BMI health and little to no stream bank erosion.*



*Monitoring on stream restoration sites show four of five restoration sites functioning well in terms of their BMI composition.*



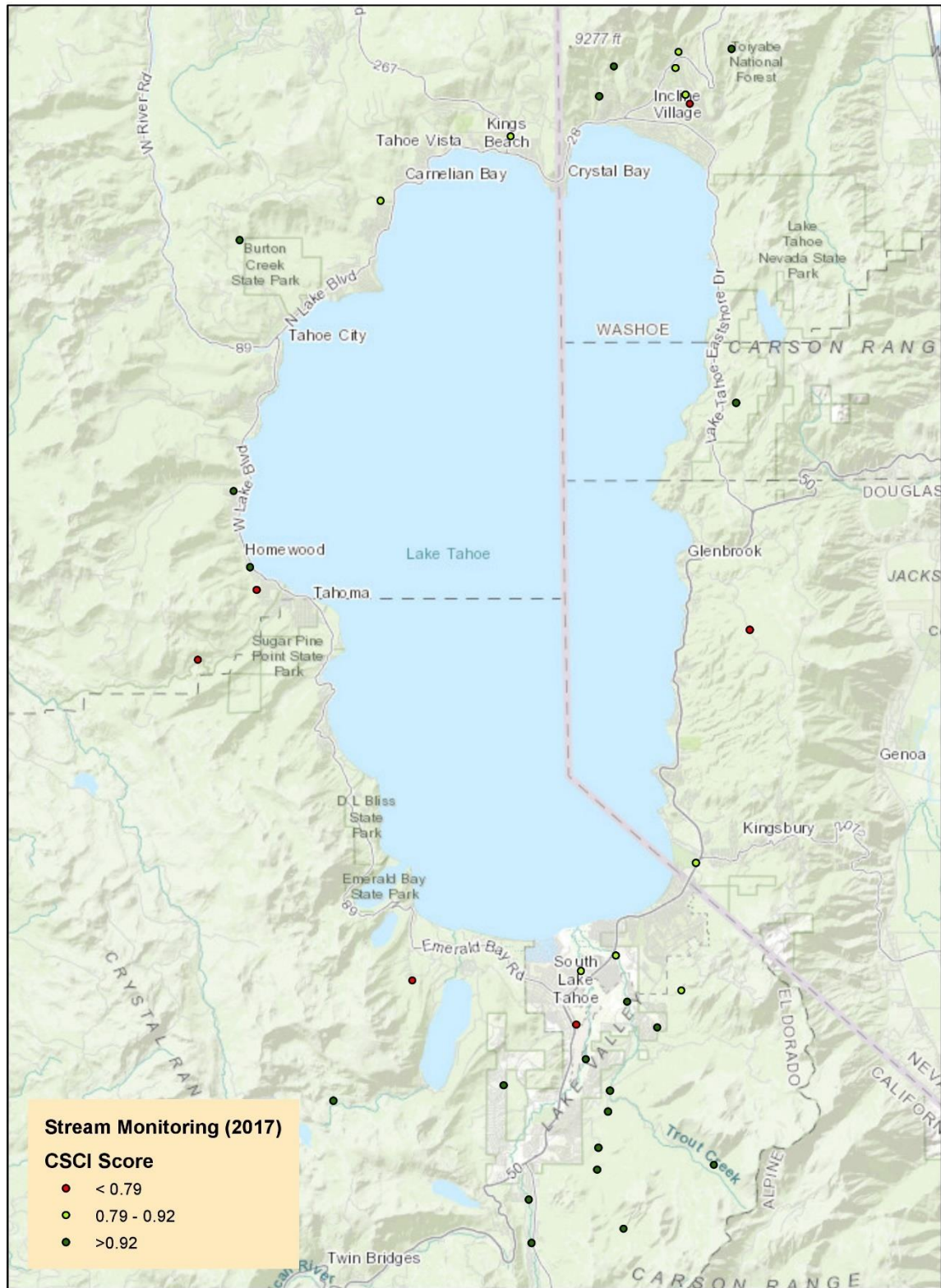


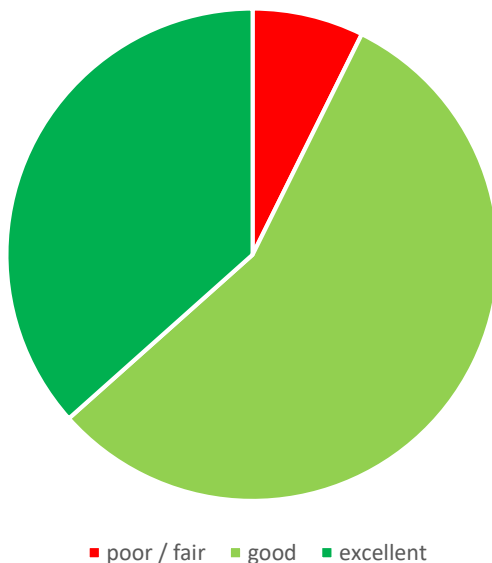
Figure 1: TRPA bioassessment monitoring locations - 2017

## MEADOW AND WETLAND MONITORING

**About:** TRPA began a pilot monitoring program for meadows and wetlands in 2016 using the California Rapid Assessment Method (CRAM). As opposed to TRPA's stream bioassessment monitoring program, which only assesses permanent streams, the meadows and wetlands monitoring program focuses on traditional wetlands and meadows in the Tahoe Basin. CRAM is a wetland monitoring method that measures wetland buffer and surrounding landscape, hydrology, physical structure, and biotic structure to give an overall "score" of wetland function. All data for Tahoe can be found at <https://www.ecoatlas.org>, where it can also be compared to data from other regions around the State of California.



2018 SEZ Monitoring Results (41 sites)



**Results:** 41 wetlands were sampled in 2018.

*A meadow showing signs of drying out from channel incision along Trout Creek.*

Of these, 93% were in the "good" or "excellent" category, and only 7% were in the "degraded" category according to State of California ratings. However, upon closer inspection, many sites show degradation, mostly attributed to past land use practices.

### Key Findings for 2018:

- Most wetlands / meadows sampled were healthy and functioning.
- Over 25% of the 41 sampled sites were not functioning properly due to channel incision

or ditching through the meadow.

- Invasive weeds were uncommon in meadows and not a large contributor to degraded wetland / meadow function for sites sampled in 2018.

**SEZ Monitoring and Restoration grant:** In 2017, TRPA was awarded a Wetland Development Grant from the U.S. EPA to design a basin-wide SEZ monitoring and restoration plan. In 2018 work focused on developing a "baseline" of current SEZ conditions. Data from SEZ and stream monitoring conducted by TRPA, as well as data from partners monitoring programs, will be used to assess the current condition of Tahoe's SEZ. This project will help set a new goal for SEZ restoration in the Basin.



*Evidence of motor vehicles in a meadow near Stateline, NV*



- There are a relatively large number of meadows still suffering from degradation caused by past land use practices such as railroad building, grazing, and development in meadows.

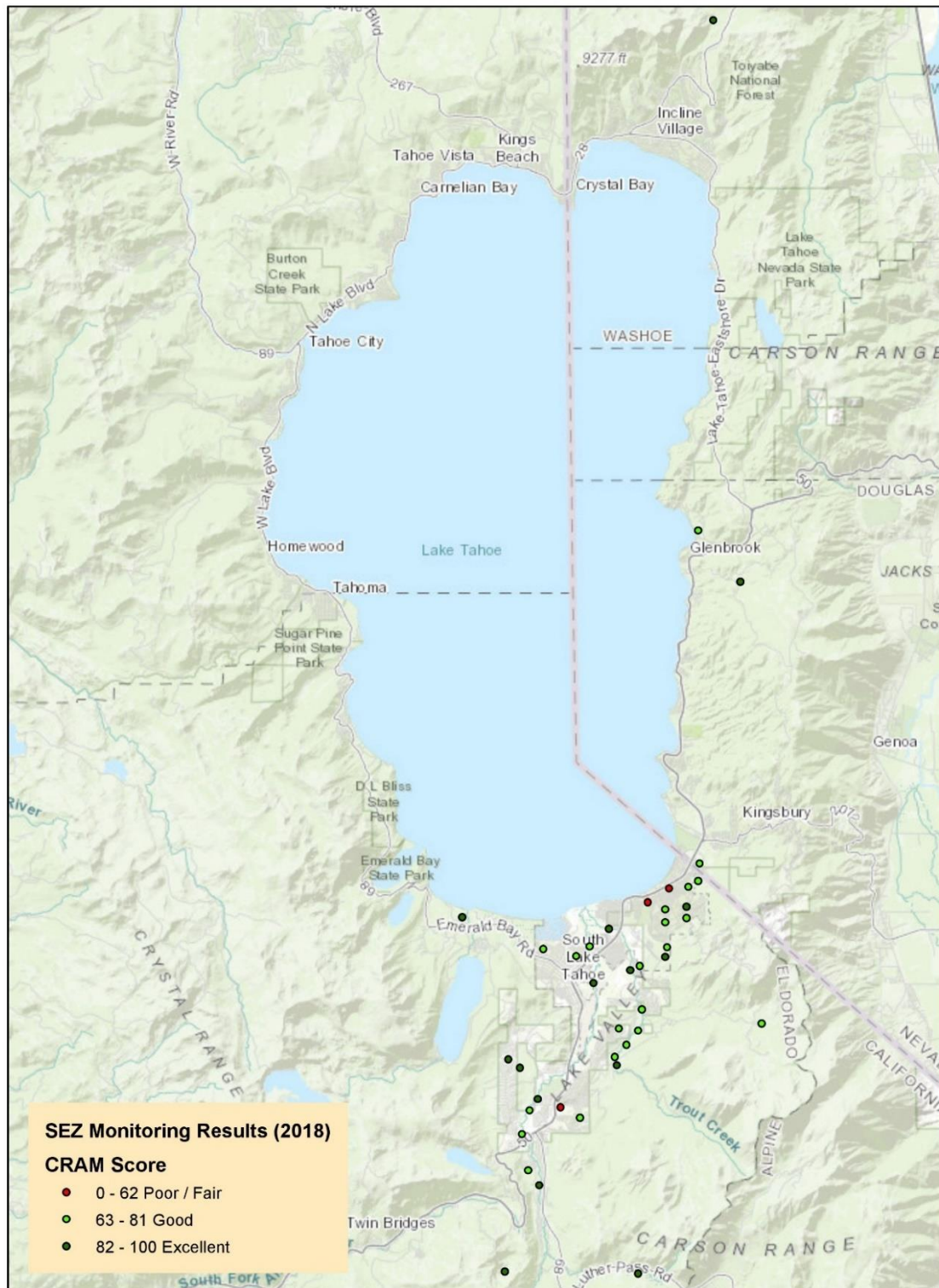


Figure 2: TRPA meadow and wetland monitoring locations – 2018





*Collecting macroinvertebrates (BMI) throughout the Tahoe Basin. BMI are an indicator of water quality and overall stream condition.*



*Channel incision and bank erosion continue to impact some meadows in the Tahoe Basin.*



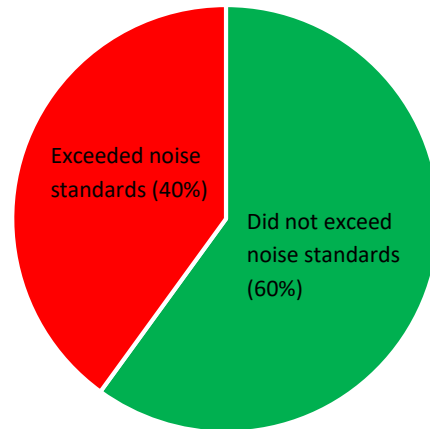
*Past land use practices such as grazing have left some meadows in the Tahoe Basin drier than normal and no longer provide the same critical functions a healthy meadow provides.*



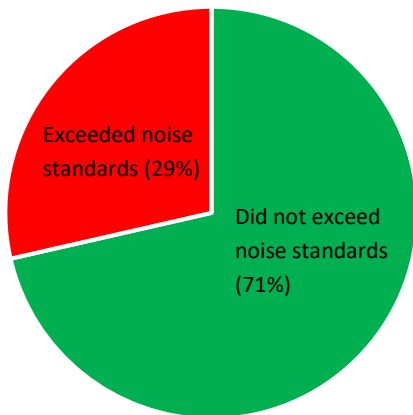
## NOISE MONITORING

**About:** TRPA has been monitoring noise in the Tahoe Basin since 1982. Noise is monitored separately in Plan Areas, transportation corridors (highways), and shorezone areas. Noise monitors are deployed for one to three weeks during peak noise periods to determine whether each area is exceeding the adopted TRPA noise standards. All noise data can be found at <https://monitoring.laketahoeinfo.org>

**Plan Areas:** There are hundreds of Plan Areas in the Tahoe Basin, each with their own allowable noise levels. TRPA monitors 140 Plan Areas over a four-year reporting period, with 35 areas monitored each year. Allowable noise levels vary from 45 decibels (dB) in low-density residential areas to 65 dB in industrial areas. The Community Noise Equivalent Level (CNEL) decibel level is used to assess noise levels. The CNEL uses a 24-hour measurement and adds penalties for noise at night and the early morning when people and wildlife are most sensitive to noise pollution. 35 Plan Areas were monitored in 2018. Of these Plan Areas, 60 percent met TRPA standards for noise while 40 percent exceeded the noise standards.



*Percent of Plan Areas in compliance with adopted noise standards (based on 35 Plan Areas monitored in 2018)*



*Percent of transportation corridor monitoring sites in compliance with adopted noise standards (based on 7 locations monitored in 2018)*

**Transportation Corridors:** Each highway in the Tahoe Basin has its own allowable noise level for the area within 300 feet of the highway. TRPA monitors 30 transportation corridor sites over a four-year reporting period, with seven to eight monitored each year. Like Plan Areas, the CNEL decibel level is used to assess noise levels and determine if highway corridors are meeting TRPA noise standards. In 2018, seven transportation corridor sites were monitored. Of these, 29 percent exceeded noise standards, while 71 percent met the standards for noise.

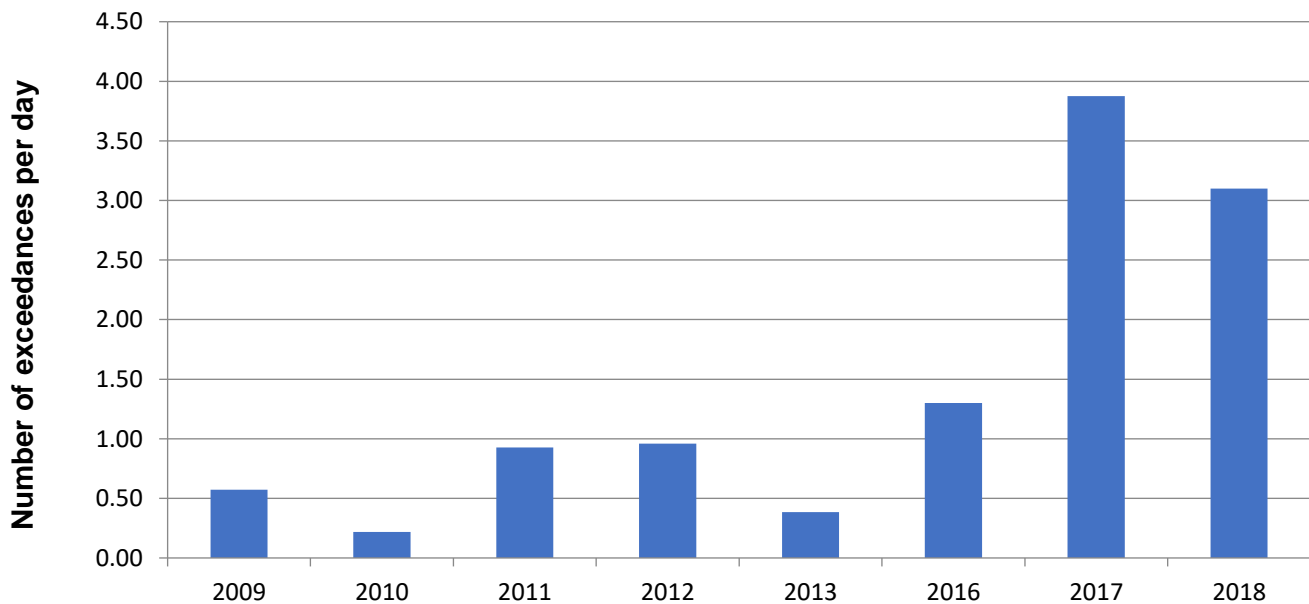


**Shorezone:** TRPA has monitored noise from motorized watercraft in the shorezone of Lake Tahoe since 2009. Normally, there are 10 locations monitored for two weeks during peak boating season ( July Fourth through Labor Day). Every noise event that exceeds 75 dB is automatically recorded. All recordings are then analyzed to determine whether they came from motorized watercraft. In 2018, only one site was monitored. Rubicon Point was monitored in 2018 because it consistently has the largest number of noise exceedances. In 2018, there were 31 noise exceedances caused by boats over 10 days for an average of just over 3 exceedances per day. 2018 showed a similar level of noise exceedances at Rubicon Point as 2017, with only a slight drop.



*A shorezone noise monitor deployed on Rubicon Point.*

**PEAK SEASON AVERAGE DAILY EXCEEDANCE RATE FOR WATERCRAFT  
(Rubicon Point only)**





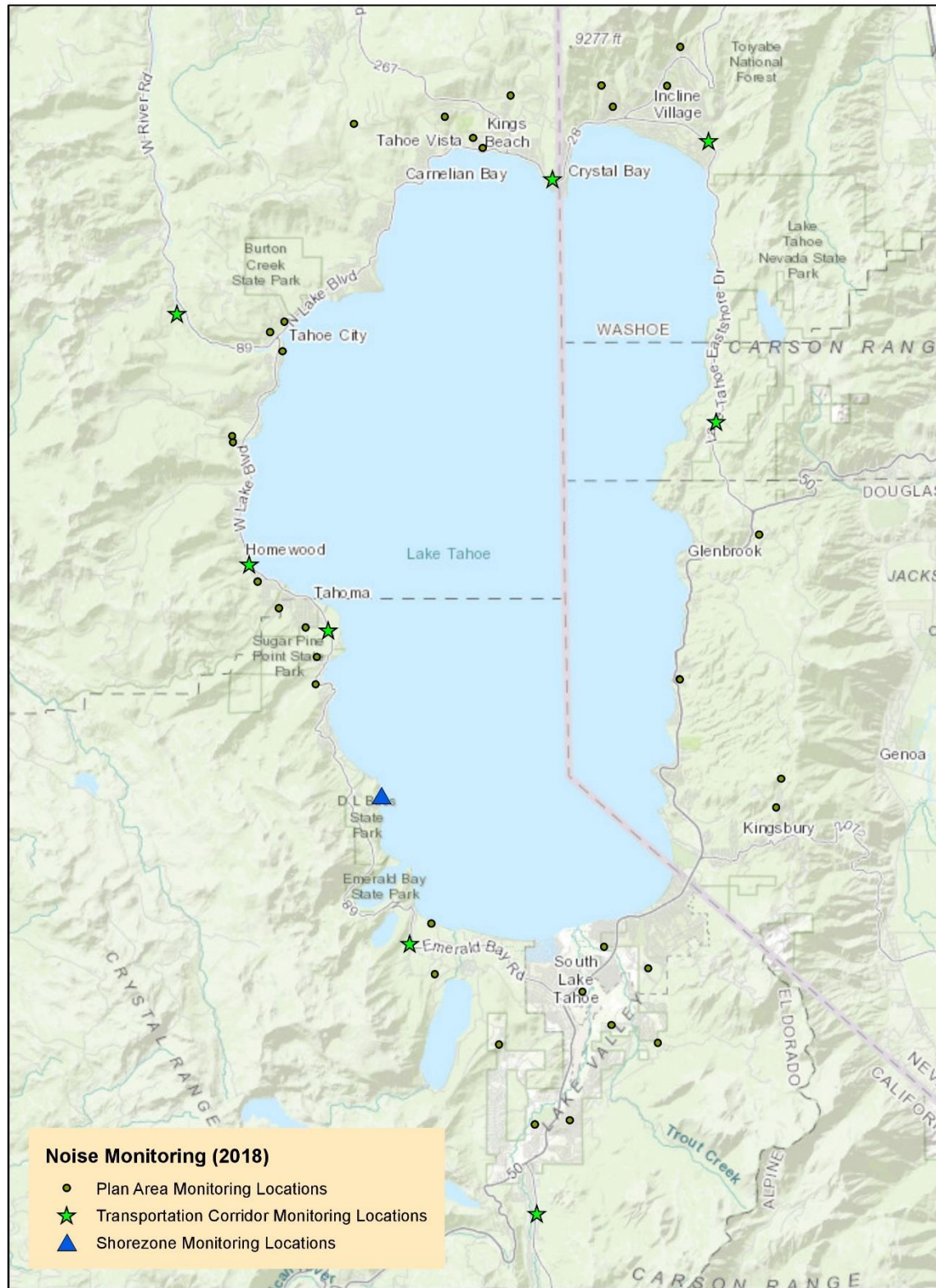


Figure 3: TRPA noise monitoring locations - 2018



## AIR QUALITY MONITORING

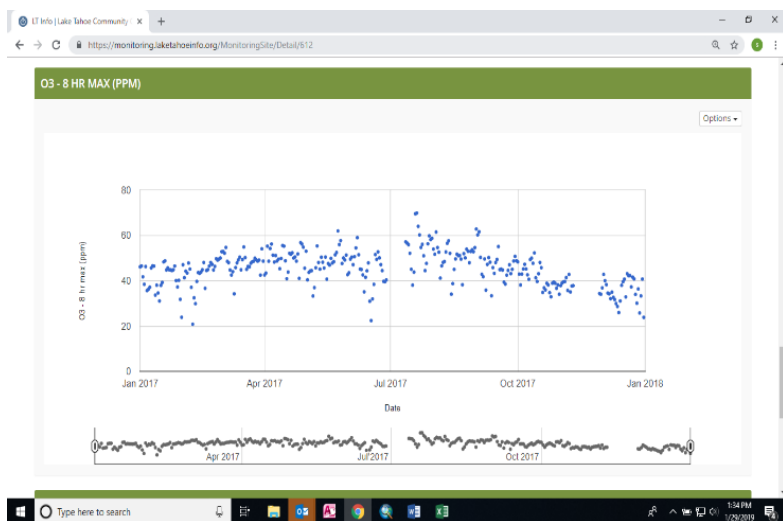


TRPA air quality monitoring station at DL Bliss State Park.

**About:** TRPA monitors air quality around the Lake Tahoe Basin using several monitoring stations operated both by TRPA and partner agencies. Particulate matter (PM), ozone (O<sub>3</sub>), visibility, oxides of nitrogen (NO<sub>2</sub>), and carbon monoxide (CO) are the main constituents monitored. In 2018, TRPA was able to put all Tahoe Basin air quality data online at <https://monitoring.laketahoeinfo.org> with daily data for all pollutants measured.

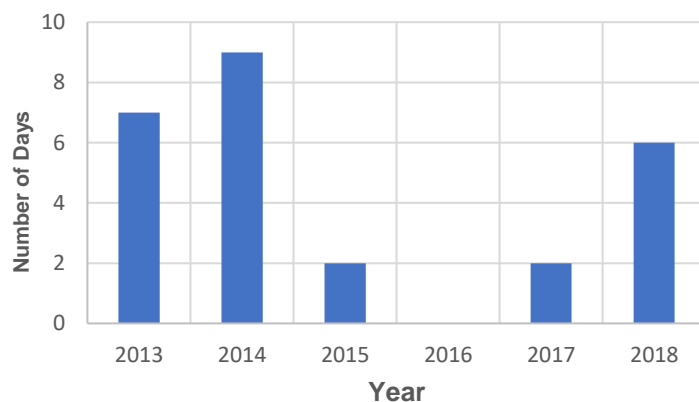
Tahoe Basin continued to show improvements in long-term trends. Carbon monoxide, ozone and particulate matter all show continued decreasing trends since monitoring began in the 1970's and 1980's. Despite overall improvements in air quality, especially from sources such as vehicle exhaust and wood burning stoves, wildfire smoke is a continued threat to air quality in the Tahoe Basin.

**Results:** In 2018, air quality in the



A screenshot of daily ozone levels in 2018 at DL Bliss State Park from <https://monitoring.laketahoeinfo.org/>.

Number of days exceeding national air quality standards for Particulate Matter 2.5 (Tahoe City station)



While overall air quality in the Tahoe Basin continues to improve, smoke from wildfires continues to impact our region.

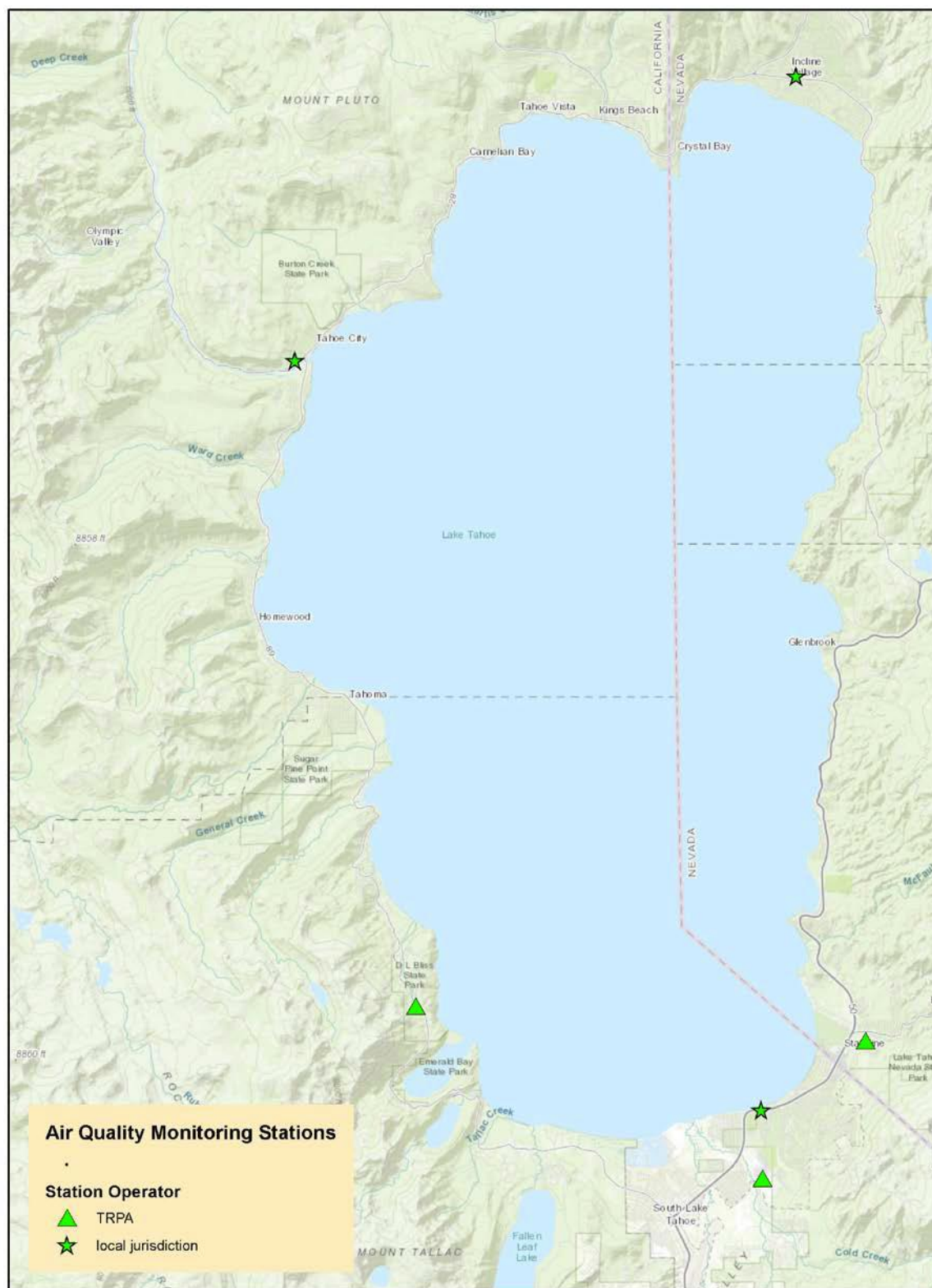


Figure 4: Tahoe Basin air quality monitoring stations - 2018



## WILDLIFE MONITORING

**About:** TRPA monitors special interest wildlife species with partners including California State Parks (CDPR), Nevada Department of Wildlife (NDOW), U.S. Forest Service (USFS), California Tahoe Conservancy (CTC), and Tahoe Institute for Natural Sciences (TINS).

**Osprey:** TRPA took over coordinating Osprey surveys in 2015 from the U.S. Forest Service, and is joined by NDOW and CDPR in the monitoring. Three surveys are completed annually by boat along the entire shoreline of Lake Tahoe and by foot at a number of other large lakes in the Basin. The number of active Osprey nests has had a general upward trend since monitoring began in 1997. In 2018, there were 22 total active nests which is a decline of 5 active nests from 2017. However, 16 of the 22 nests successfully



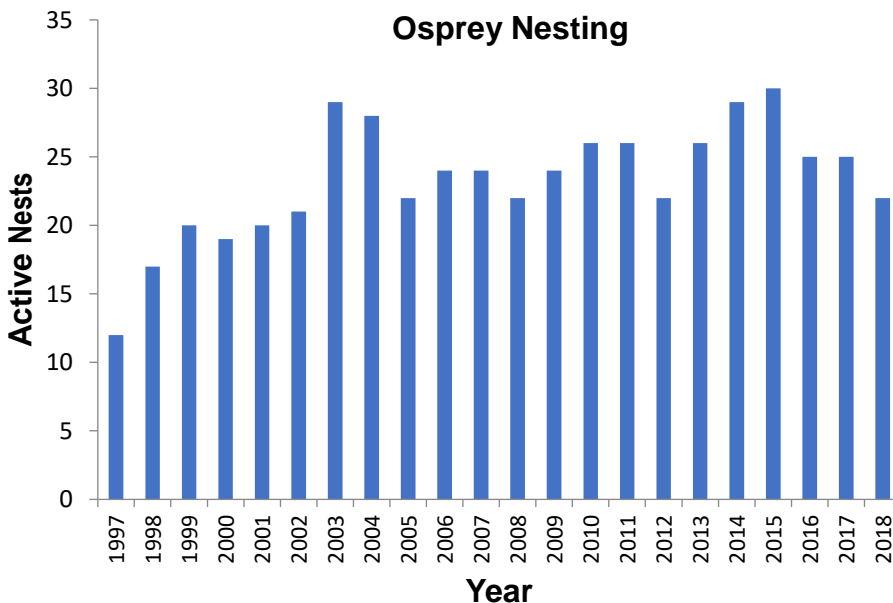
*An adult Osprey in its nest at Fallen Leaf Lake. Credit: Beth Vollmer, TRPA*

produced fledglings which is a very high number of successful nests compared with

other years. Emerald Bay, D.L. Bliss, and the undeveloped portion of Lake Tahoe's East Shore continued to be the main reproductive areas for Osprey in 2018. In 2018, four active nests were also observed on Tahoe's North Shore.

**Peregrine Falcon:** TRPA, in collaboration with TINS and NDOW, took over Peregrine Falcon surveys in 2015 from the USFS. Peregrine Falcons were monitored by the USFS from 2009-2014. Falcon nesting has

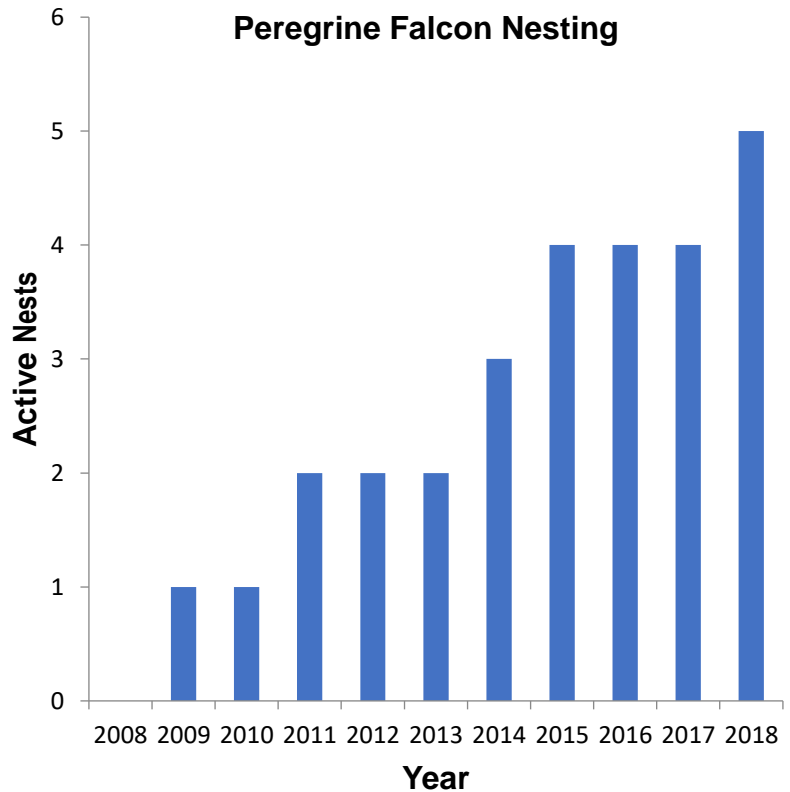
increased dramatically from 2008 when no nests were observed to a record five active nests in 2018. Four of these nests successfully produced fledglings. In 2018, TRPA, NDOW, USFS, and TINS also continued monitoring



potential climbing impacts on nesting Peregrines at Castle Rock. While aggressive behavior towards climbers (a sign of disturbance) by the Peregrines was not frequently observed, the nest was not successful for the second year in a row. Monitoring of this nest alongside climbing routes will continue in 2019 to determine climbing and hiking impacts to the Peregrines.

#### Wintering Bald Eagle:

TRPA participates in the annual mid-winter Bald Eagle Count at Lake Tahoe led by TINS. The count has taken place since 1998. Bald Eagles from colder northern areas winter in Lake Tahoe and take advantage of prime habitat and available food. In 2018, a total of 22 individuals were counted, a slight drop from the record high count of 27 individuals recorded in 2017. Wintering Bald Eagles utilize all portions of Lake Tahoe.

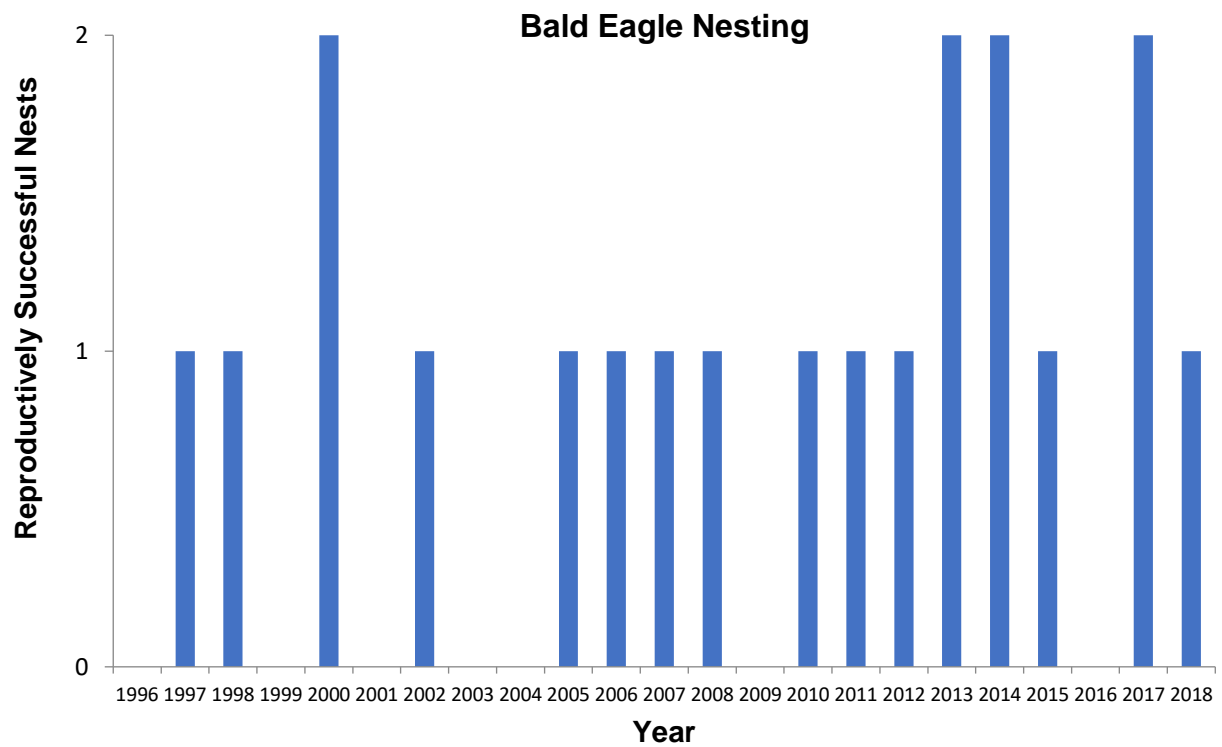
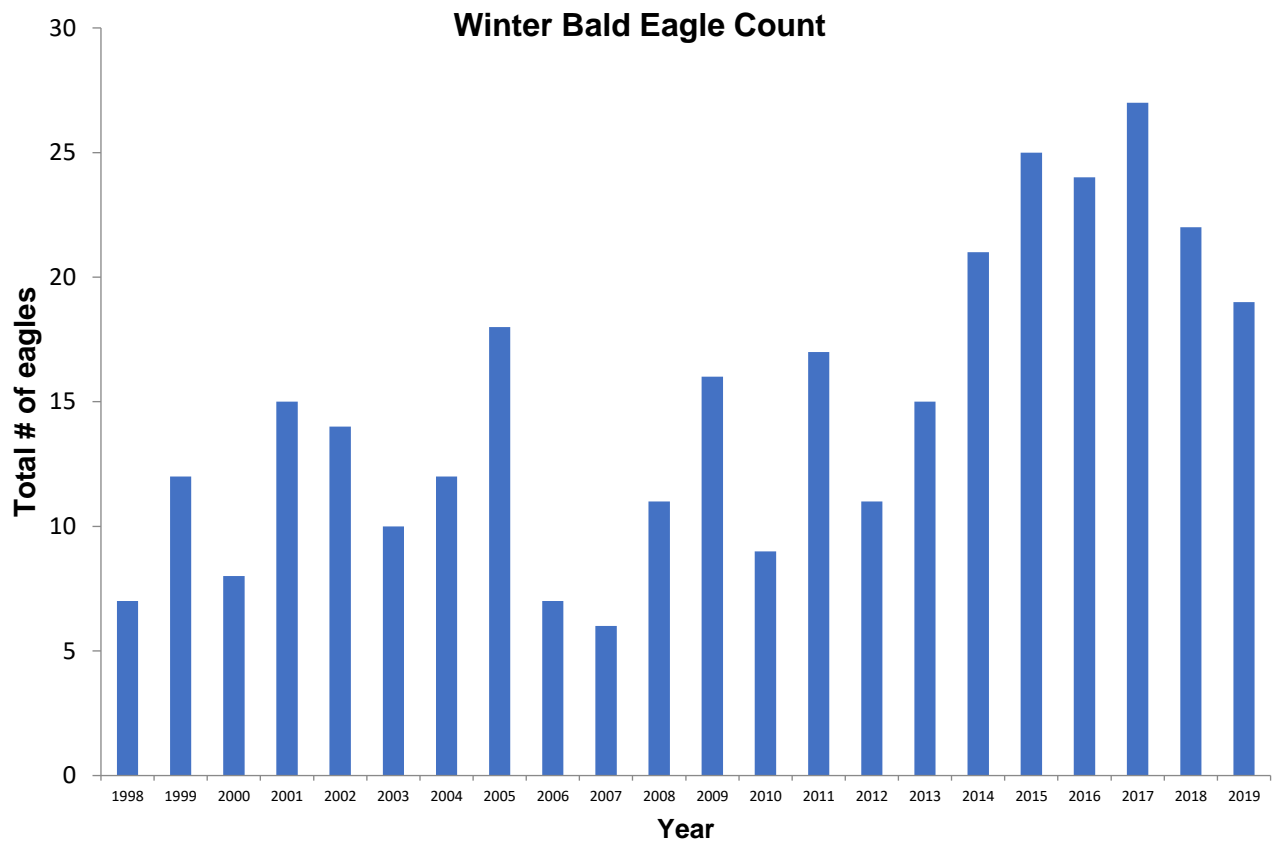


TRPA conducting Osprey surveys with NDOW and CA State Parks. Photo Credit: TRPA

**Nesting Bald Eagle:** Nesting Bald Eagles are searched for during Osprey boat surveys. However, the only Bald Eagle nests found since monitoring began have been on Nevada State Parks and California State Parks property and have been monitored by their respective biologists. Since monitoring began in 1996, the number of successful Bald Eagle nests in the Basin has varied between zero and two. In 2018, there

was only one active nest at Marlette Lake. Both the Emerald Bay and Sugar Pine Point nests were inactive. The Marlette Lake nest was successful in producing fledglings.





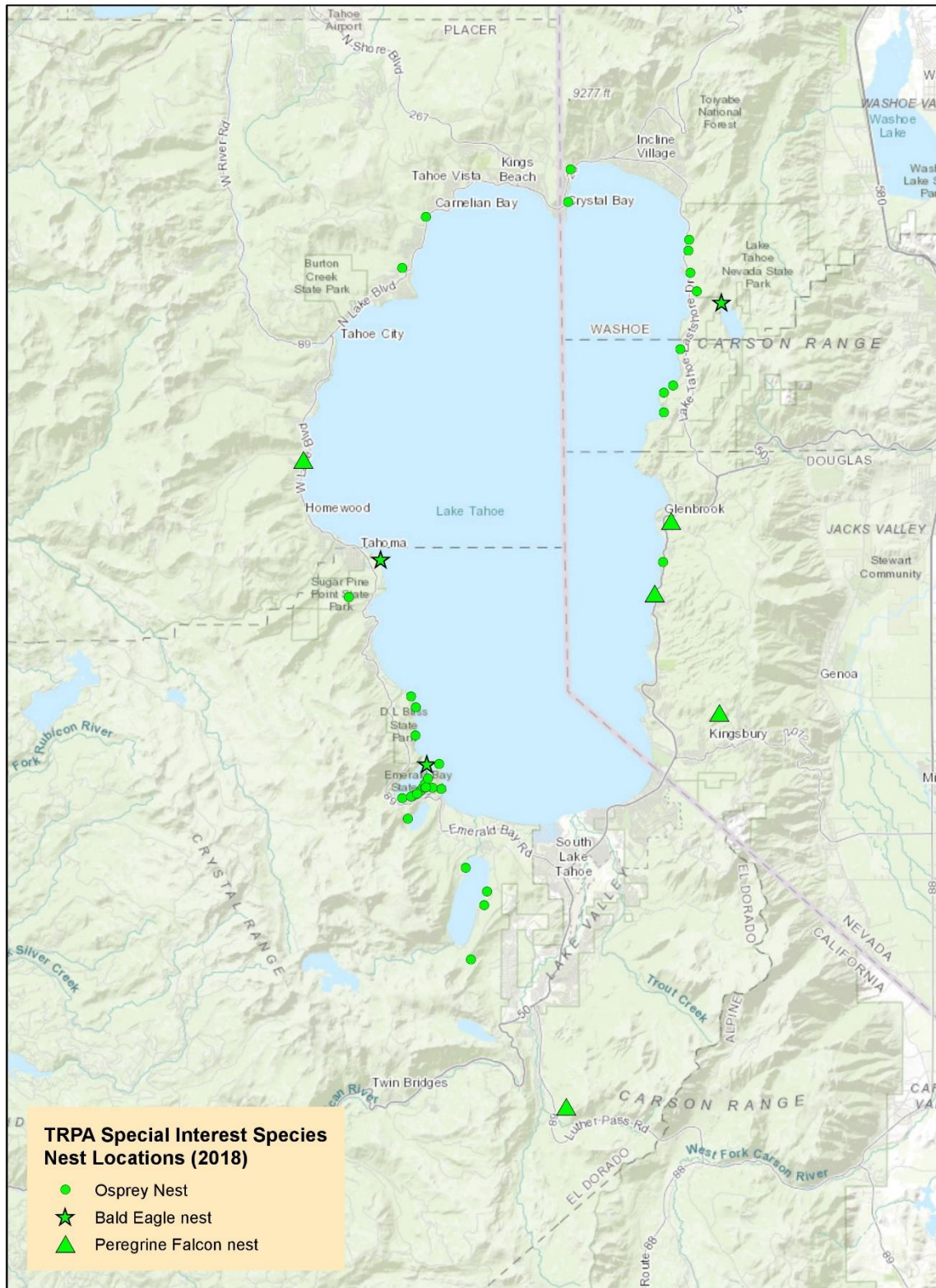


Figure 5: TRPA Special Interest Species Nest Locations - 2018



## BICYCLE AND PEDESTRIAN MONITORING

**About:** In 2015, as part of the update to the Active Transportation Plan, TRPA developed the Lake Tahoe Region Bicycle and Pedestrian Monitoring Protocol. Implementation began in 2015 with seasonal videos recorded and limited automated counting. In 2016, TRPA purchased automated bicycle and pedestrian counters that collect year-round data, differentiate between the two different users, and collect directional information. Through partnerships with



*A new bike / pedestrian counter installed on the Truckee River Trail near Tahoe City.*

local jurisdictions, counters were installed throughout the Region on paths. Additional counters that collect bicycle travel data on bike lanes and information about the number of pedestrians walking on sidewalks are also rotated on a biennial basis by TRPA staff. In 2018, over 20 counters were active. TRPA and local partners monitor bicycle and pedestrian activity to understand high use areas and trends, measure mode-split, and support infrastructure grant applications and reporting. Count information also informs policies and programs targeted to improve and support active transportation. All data can be found at <https://monitoring.laketahoeinfo.org>

**Results:** Nearly 2.4 million bicycle and pedestrians were counted on TRPA counters in 2018. The highest daily average of bicycles and pedestrians was at the intersection of Pioneer Trail and US 50 near Stateline, NV where over 1,600 people were counted on average throughout the year. Even in



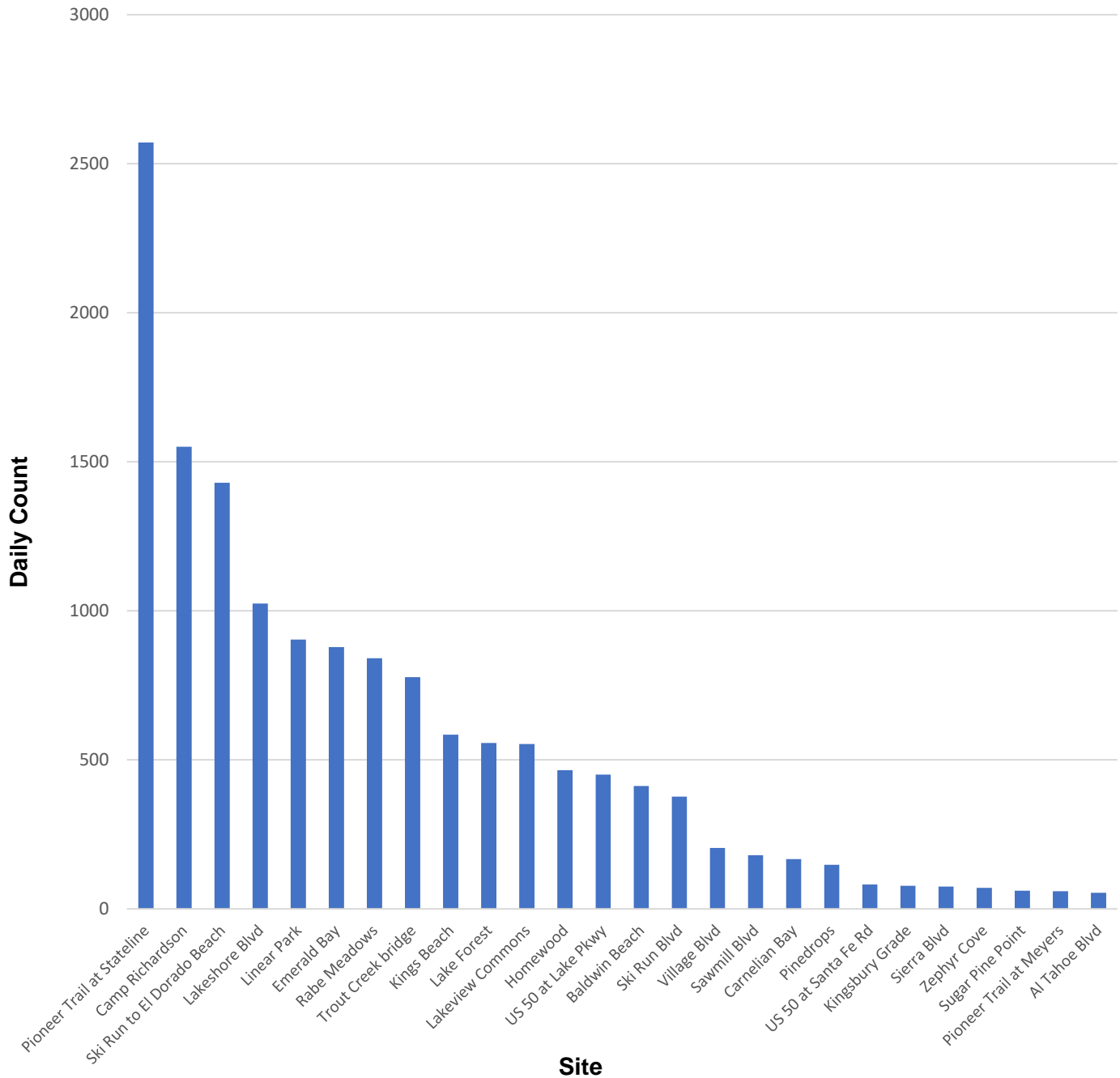
*A bike lane counter on US 50 near Ski Run Blvd in South Lake Tahoe.*

November, the least used part of the year, over 1,000 people per day were counted at this location. Most locations had very high usage in the summer and much smaller usage in the winter. However, some locations like the above-mentioned Pioneer Trail and US 50 site, Linear Park in South Lake Tahoe, and the Ski Run to El Dorado Beach Trail in South Lake Tahoe were used heavily throughout the year. This continues to show the importance of the winter bike path and sidewalk plowing operations being conducted by numerous local governments.

New bike paths caught on quick in 2018,

where the new Ski Run to El Dorado Beach path had over 1,000 users per day in its inaugural opening year of Summer 2018. New counters were installed on the Truckee River Trail and Dollar Creek Trail in late 2018, which will give us a better idea of counts on these highly-used North Shore trails. Limited bike lanes also had counters in Summer 2018, with the focus on bike lanes on Hwy 50 in South Lake Tahoe. Bicyclists in bike lanes during peak summer along Hwy 50 ranged from 40 per day to 90 per day.

**Bicycle and Pedestrian Daily Counts (peak summer: July 8th - September 4th, 2017 & 2018)**





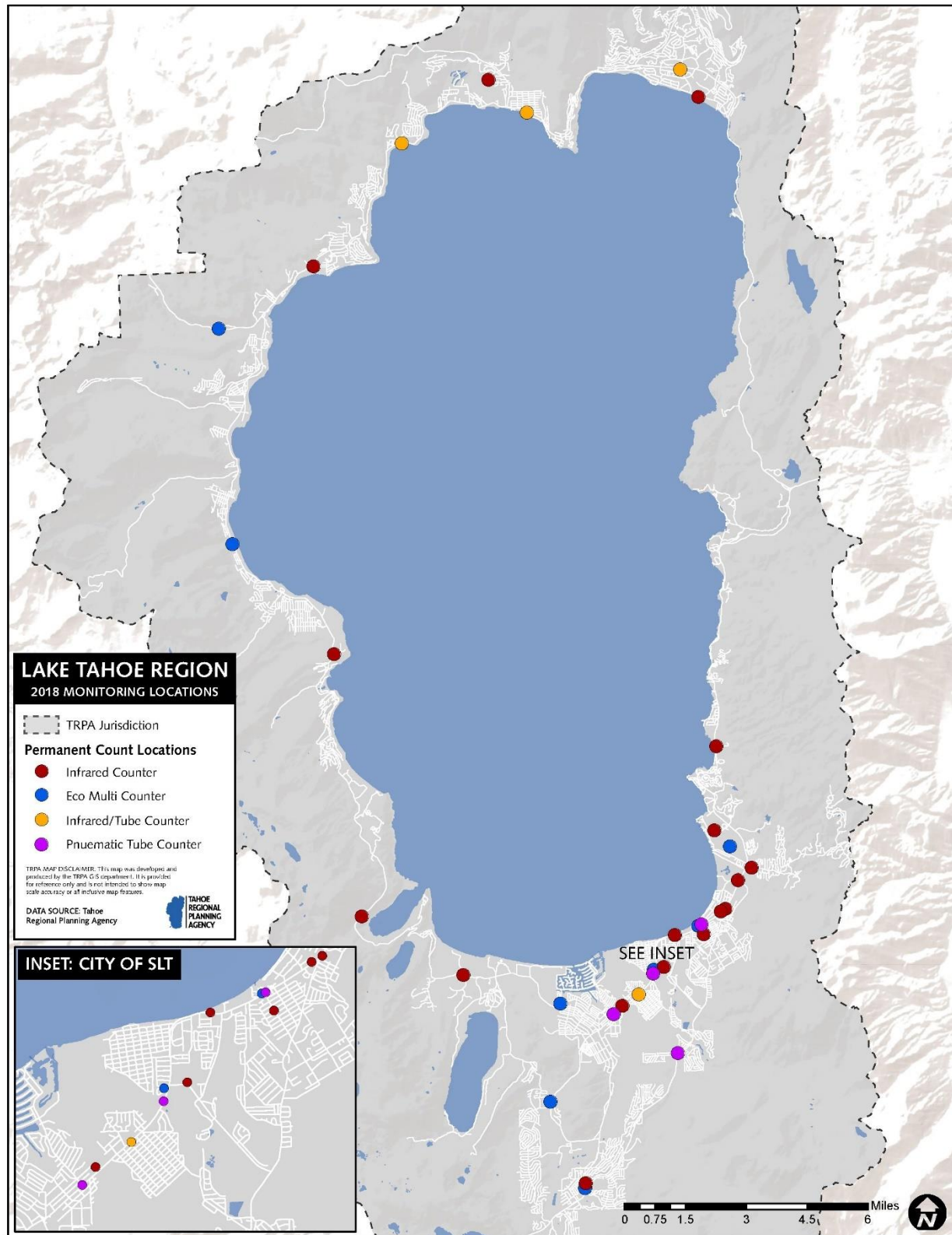


Figure 6: Bicycle and Pedestrian Count Locations - 2018

## TAHOE YELLOW CRESS MONITORING



*Tahoe yellow cress. Credit: Tom Lotshaw*

**About:** Tahoe yellow cress (TYC) is a small native plant that grows on the shoreline of Lake Tahoe and nowhere else in the world. It lives only on the sandy beaches and dunes at the ever-changing margin of the lake. As recently as 1996, this unique member of the mustard family teetered on the brink of extinction when it

disappeared from beaches in Nevada and was found growing at less than 10 sites on the California side of the lake. The concerted and collaborative approach to protection and restoration by the partners in the Basin is altering the trajectory for this sensitive plant. While TYC's population is still at risk, it is stable, and was removed from the Endangered Species candidate list in 2015. TRPA participates in annual Tahoe yellow cress surveys with agency partners led by the U.S. Forest Service in 2018. In 2018, two TRPA staff participated in the field surveys and the TRPA watercraft team helped surveyors get to locations only accessible by boat. All data can be found at <https://monitoring.laketahoeinfo.org>

**Results:** In 2018, Lake Tahoe remained near its legal limit for the second summer in a row. This greatly reduced TYC habitat and surveys were initiated to ensure the plant is surviving despite the high lake levels. The 2018 survey results show a slight increase in the number of occupied sites over 2017, a great sign of TYC resilience despite high lake levels. The TYC population appears to be stable despite the high lake level.

### Tahoe Yellow Cress survey results (up to 2018)

